

WHAT IS CLAIMED IS:

1. A process for the preparation of beads having a crosslinked inorganic matrix with a size controlled in the millimeter range, characterized  
5 in that it consists in preparing gelled beads by pouring a suspension comprising a precursor of the inorganic matrix and an alginate dropwise into a solution of a polyvalent cation salt, the pH of which is less than 3, and in crosslinking the  
10 precursor of the inorganic matrix by a sol-gel process.
2. The process as claimed in claim 1, characterized in that the pH is less than 2.  
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3. The process as claimed in claim 1, characterized in that the alginate is an alkali metal alginate.
4. The process as claimed in claim 1, characterized  
20 in that the beads are maintained in the reaction medium for a time of 1 hour to 24 hours for the gelling of the alginate.
5. The process as claimed in claim 1, characterized  
25 in that the precursor of the inorganic matrix is an inorganic compound capable of crosslinking by a sol-gel process chosen from inorganic compounds which have hydroxyl groups bonded to a metal when they are in solution.  
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6. The process as claimed in claim 5, characterized in that the precursor of the inorganic matrix is a  
35 compound capable of gelling according to the polymerization of molecular entities (PME) mechanism.
7. The process as claimed in claim 6, characterized in that the precursor is an alkali metal silicate.

8. The process as claimed in claim 5, characterized in that the precursor of the inorganic matrix is a compound capable of gelling according to the destabilization of colloidal solutions (DCS) mechanism.
9. The process as claimed in claim 8, characterized in that the precursor of the inorganic matrix is an alumina of boehmite type or a colloidal silica.
10. The process as claimed in either of claims 6 and 7, characterized in that the precursor of the inorganic matrix is crosslinked by an alkali metal fluoride during a stage following the gelling of the alginate, the polyvalent cation salt used for the gelling of the alginate having a cation other than calcium.
11. The process as claimed in claim 10, characterized in that the crosslinking of the inorganic matrix is carried out while keeping the beads suspended with gentle stirring for a time of between 6 and 72 hours.
12. The process as claimed in either of claims 8 and 9, characterized in that the precursor of the inorganic matrix is crosslinked under the effect of the pH of the reaction medium during the gelling of the alginate.
13. The process as claimed in claim 12, characterized in that the reaction medium, comprising the beads formed by the gelled alginate and the crosslinked inorganic matrix, is maintained at ambient temperature for a time of between 1 and 24 hours.
14. The process as claimed in claim 1, characterized in that it is carried out at a temperature between 10°C and 60°C.

15. The process as claimed in claim 1, characterized in that the polyvalent cation salt used for the gelling of the alginate is chosen from salts for which the anion is a halide, a nitrate or a sulfate and for which the cation is an alkaline-earth metal, transition metal or noble metal cation.
16. The process as claimed in claim 1, characterized in that at least one additive chosen from pigments and organic coloring agents for cosmetic use, kaolin powder, clays, coloring agents and pore-forming agents is added to the suspension comprising the precursor of the inorganic matrix and the alginate.
17. The process as claimed in claim 1, characterized in that the beads obtained after crosslinking the inorganic matrix are extracted from the reaction medium by filtration.
18. The process as claimed in claim 17, characterized in that the beads separated by filtration are washed with water or with a basic aqueous solution at a pH < 8.
19. The process as claimed in either of claims 17 and 18, characterized in that the beads separated by filtration are subjected to drying in the air, optionally after having been washed with acetone or with alcohol.
20. The process as claimed in either of claims 17 and 18, characterized in that the beads separated from the reaction medium by filtration are dried by lyophilization.
21. The process as claimed in either of claims 17 and

- 18, characterized in that the beads extracted from the reaction medium by filtration are washed with acetone or with alcohol and are then placed in a solution comprising an alkoxide of a metal diluted in an anhydrous organic solvent.
22. The process as claimed in either of claims 17 and 18, characterized in the beads separated from the reaction medium by filtration are subjected to calcination at a temperature of between 400°C and 800°C.
23. A material obtained by a process as claimed in claim 1, formed of beads suspended in an aqueous medium, characterized in that the beads have a diameter of 0.5 mm to a few mm and are composed of a hydrated matrix of gelled alginate, a crosslinked inorganic matrix and a hydroxide of the polyvalent cation of the salt used as gelling agent.
24. A bead obtained by a process as claimed in either of claims 19 and 20, characterized in that it is composed of an alginate network, a crosslinked inorganic matrix and a hydroxide of the cation originating from the agent for gelling the alginate.
25. A bead obtained by a process as claimed in claim 21, characterized in that it is formed of a core composed of an alginate network, a crosslinked inorganic matrix and a hydroxide of the cation originating from the agent for gelling the alginate and of a surface layer of metal oxide or hydroxide.
26. A bead obtained by a process as claimed in claim 22, characterized in that it is composed of a crosslinked inorganic matrix and a hydroxide of

the cation originating from the agent for gelling the alginate, is porous and is devoid of organic compounds.

- 5 27. The bead as claimed in one of claims 24 to 26, characterized in that it additionally comprises at least one compound chosen from pigments and organic coloring agents for cosmetic use, kaolin powder, clays and coloring agents.